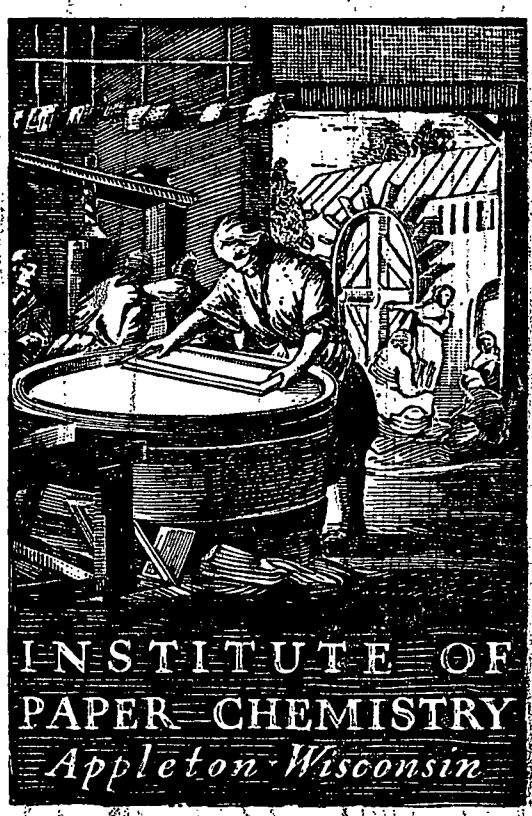

CONTINUOUS BASE-LINE STUDY

Project 1108-13

Report 184

A Progress Report

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

August 1, 1963

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS BASE-LINE STUDY

Project 1108-13

Report 184

A Progress Report

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

August 1, 1963

TABLE OF CONTENTS

TABLE OF CONTENTS

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS BASE-LINE STUDY

INTRODUCTION

As requested by the Technical Committee of the Fourdrinier Kraft Board Institute, Inc., the reports pertinent to the continuous base-line study on 42-lb. fourdrinier kraft linerboard are now being prepared by The Institute of Paper Chemistry on a bimonthly basis instead of the previous monthly basis. This new system was initiated on August 1, 1961. This report is the twelfth under the new system and presents results obtained during the months of June and July, 1963.

PRESENTATION AND DISCUSSION OF TEST RESULTS

Each sample lot received for evaluation during June and July was evaluated for basis weight, caliper, bursting strength, and Elmendorf tearing strength. The average strength results for each mill may be seen in Table I and are graphically presented in Fig. 1 to 5. In addition to a comparison of the current mill averages for the various tests, Table I also shows the current F.K.I. averages, the cumulative F.K.I. averages, and F.K.I. indexes. For each test, the current mill average represents the average obtained on all sample lots evaluated from a given mill during a given period, the current F.K.I. average represents the average of the current mill averages, and the cumulative F.K.I. average represents the average of the current F.K.I. averages for the previous twelve months excluding the current period. The F.K.I. index expressed in per cent is the ratio of the current F.K.I. average to the cumulative F.K.I. average.

In Table II, a tabulation of the number of sample lots submitted by each mill during June and July is shown.

Supplementary to the basis weight data given in Table I, a tabulation is given in Table III of the amount by which the current basis weight average for each mill varies from the 42-lb. specification set forth in Rule 41.

Shown below from Table I are the maximum and minimum current mill averages for each test and also the current and cumulative F.K.I. averages.

TABLE I

SUMMARY OF COMPOSITE MILL AVERAGES--JUNE AND JULY, 1963

Mill	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. gage	Elmendorf Tear, g./sheet In Machine	Elmendorf Tear, g./sheet Cross Machine
A	No samples submitted.				
B	42.9	13.2	116	291	351
C[a]					
D	42.7	13.2	108	380	413
E	No samples submitted.				
F	43.2	13.4	116	321	370
G	43.9	13.1	111	354	399
H	42.1	13.5	112	348	412
I	43.3	12.8	113	341	393
J	42.1	13.7	105	356	380
K	43.2	12.1	111	332	371
L	43.1	12.5	113	326	363
M	42.7	13.1	113	304	363
N	42.4	12.7	101	370	398
O	42.7	12.9	104	316	364
P	43.1	12.7	110	330	396
Q	42.8	12.5	109	304	364
S	42.8	12.5	112	387	423
T	43.0	11.7	109	374	414
U	42.2	12.7	106	358	398
V	No samples submitted.				
W	43.2	13.4	112	347	404
X	42.2	12.5	108	320	367
Current FKI average:	42.8	12.9	110	340	387
Cumulative FKI average:	42.9	12.7	109	330	375
FKI index, %	99.8	101.6	100.9	103.0	103.2

[a]Current mill averages have been omitted in compliance with Technical Committee's request that current mill averages based on evaluations of fewer than three sample lots of linerboard should be excluded from the summary table and from the calculation of the current F.K.I. averages.

TABLE II

NUMBER OF SAMPLE LOTS SUBMITTED BY EACH MILL
DURING JUNE AND JULY, 1963

Mill Code	Number of Sample Lots
A	0
B	7
C	2
D	4
E	0
F	7
G	12
H	4
I	8
J	3
K	5
L	8
M	4
N	3
O	7
P	8
Q	5
S	7
T	7
U	3
V	0
W	4
X	16
Total	124

TABLE III

PERCENTAGE DEVIATION FROM 42-LB. BASIS WEIGHT SPECIFICATION
JUNE AND JULY, 1963

Mill Code	Percentage Deviation
A	-
B	+2.1
C	+1.4
D	+1.7
E	-
F	+2.9
G	+4.5
H	+0.2
I	+3.1
J	+0.2
K	+2.9
L	+2.6
M	+1.7
N	+1.0
O	+1.7
P	+2.6
Q	+1.9
S	+1.9
T	+2.4
U	+0.5
V	-
W	+2.9
X	+0.5

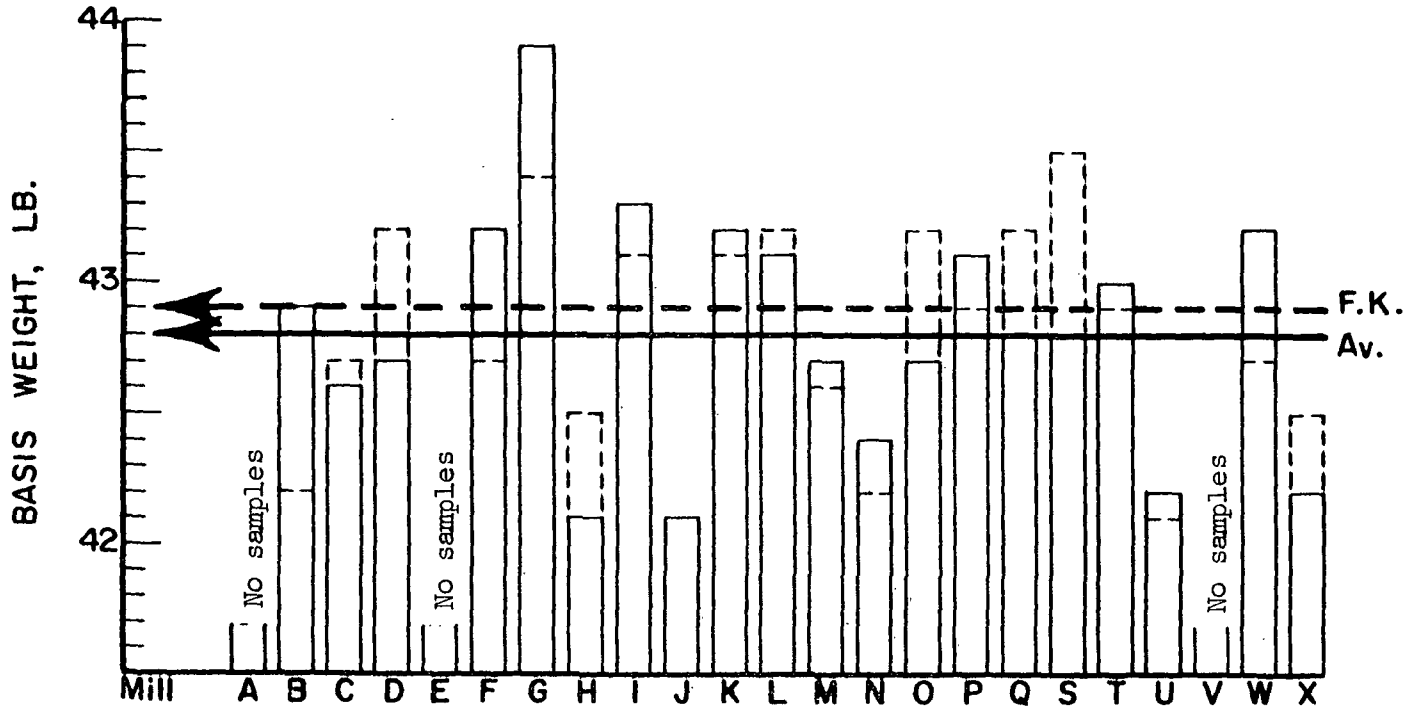

Figure 1. Comparison of Basis Weight Results

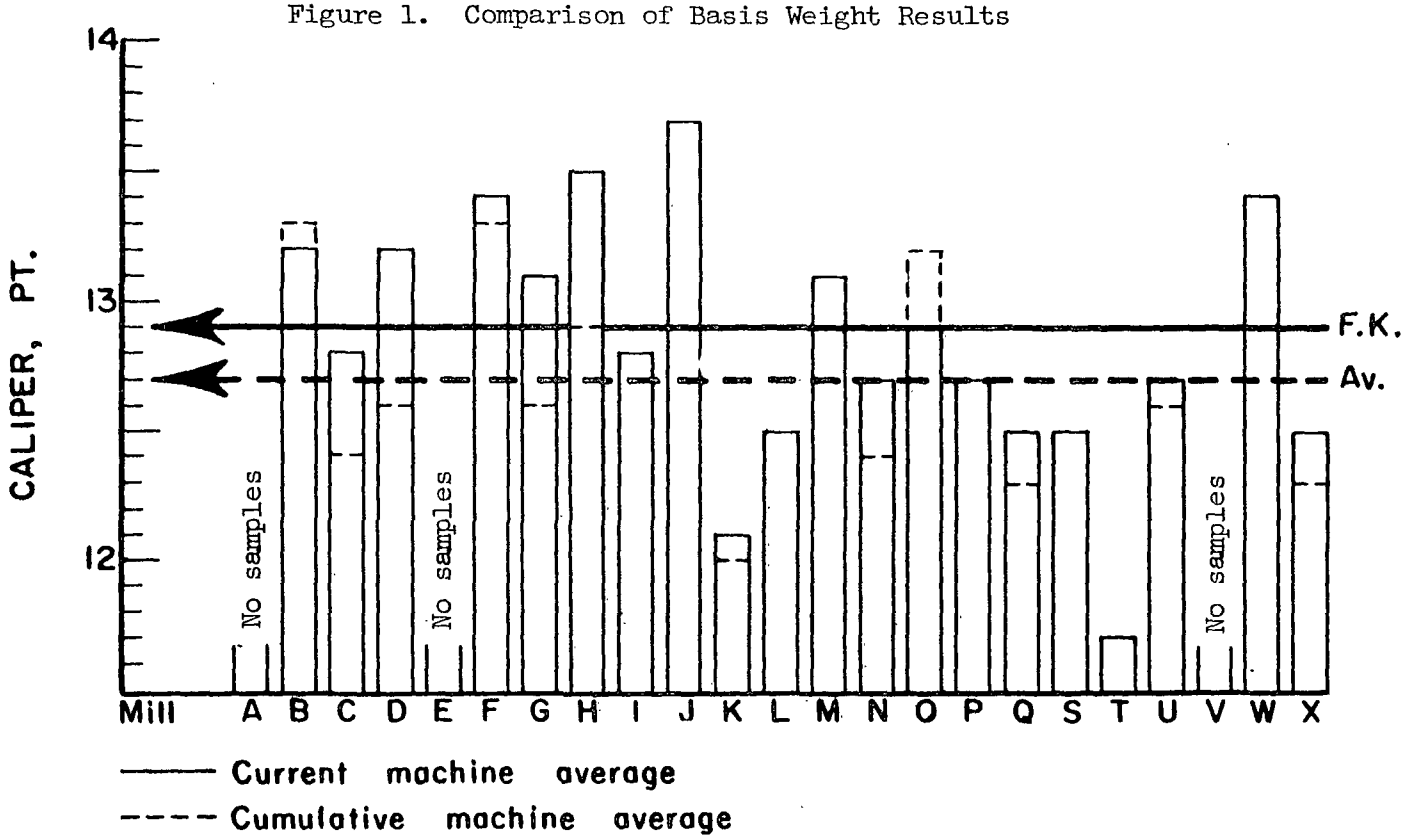

Figure 2. Comparison of Caliper Results

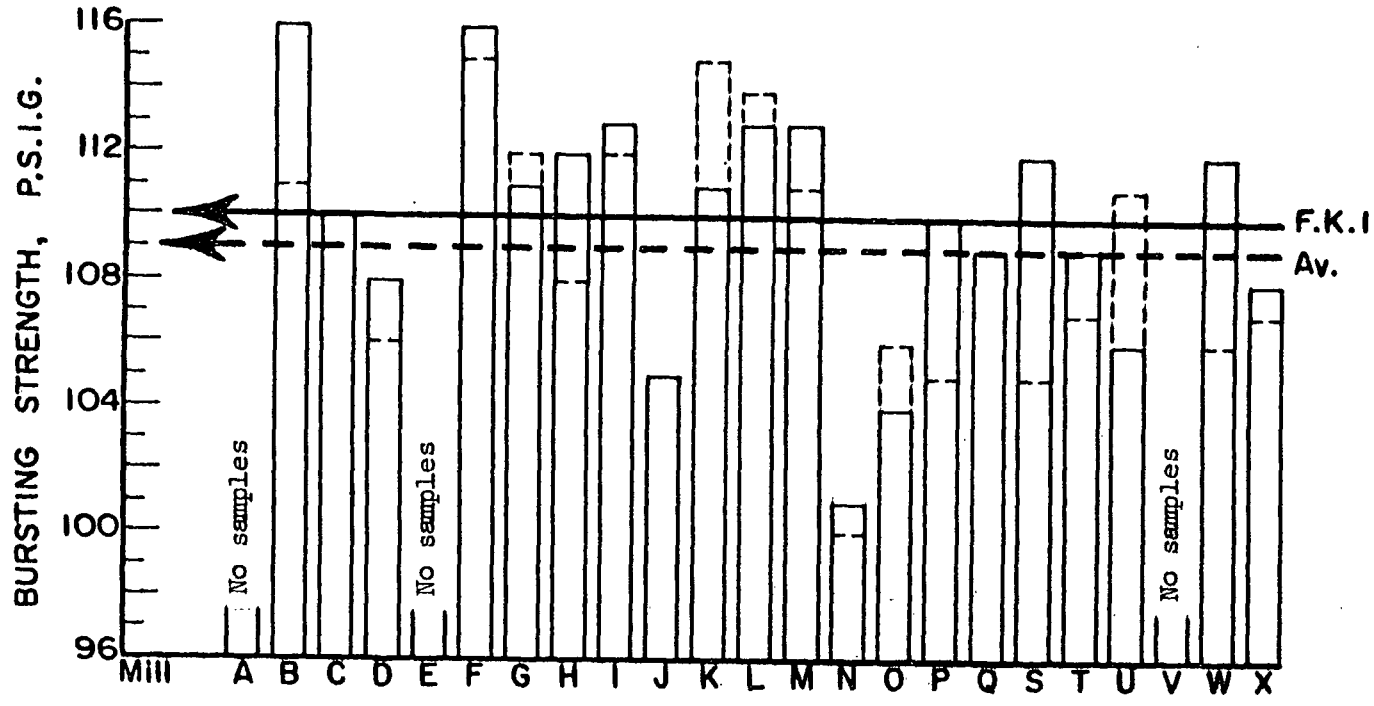

Figure 3. Comparison of Bursting Strength Results

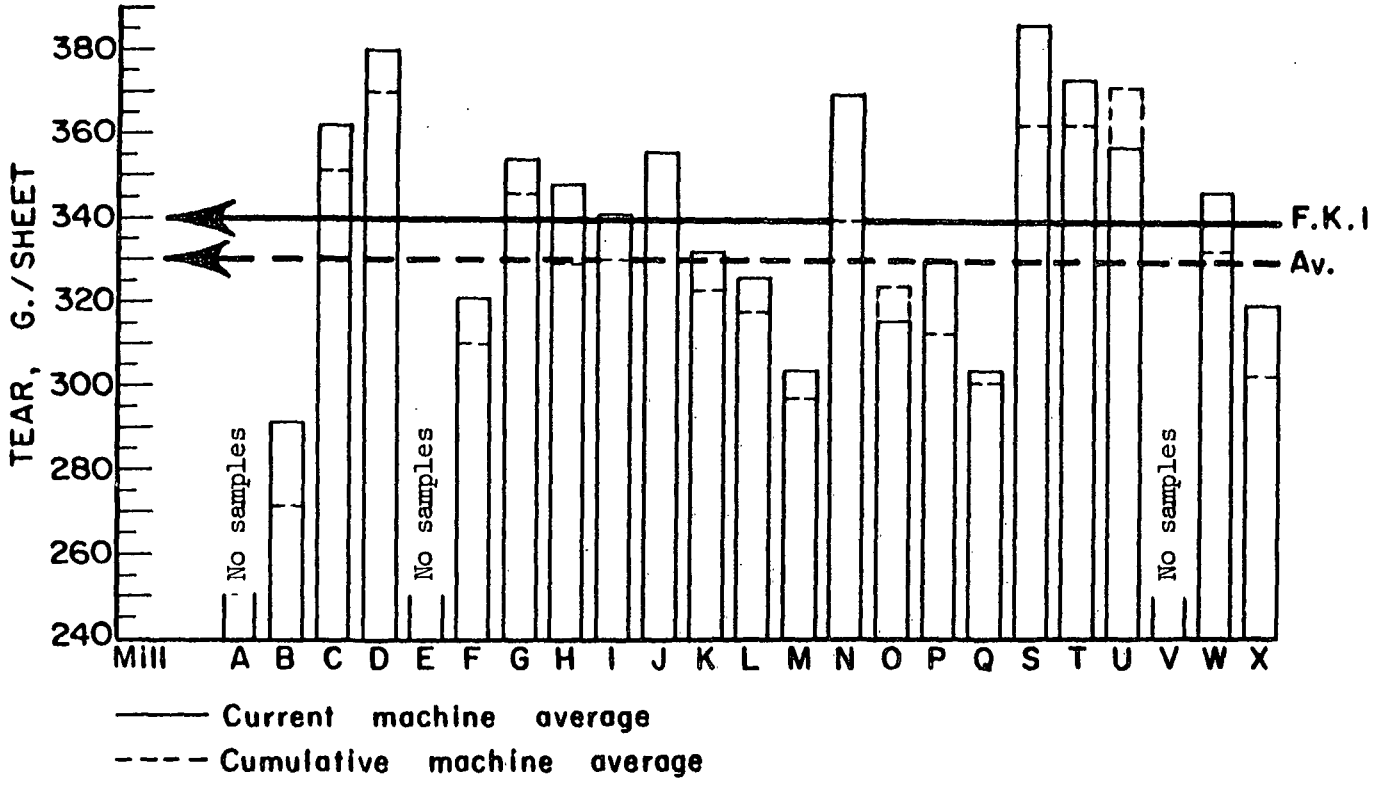

Figure 4. Comparison of Machine-Direction Tear Results

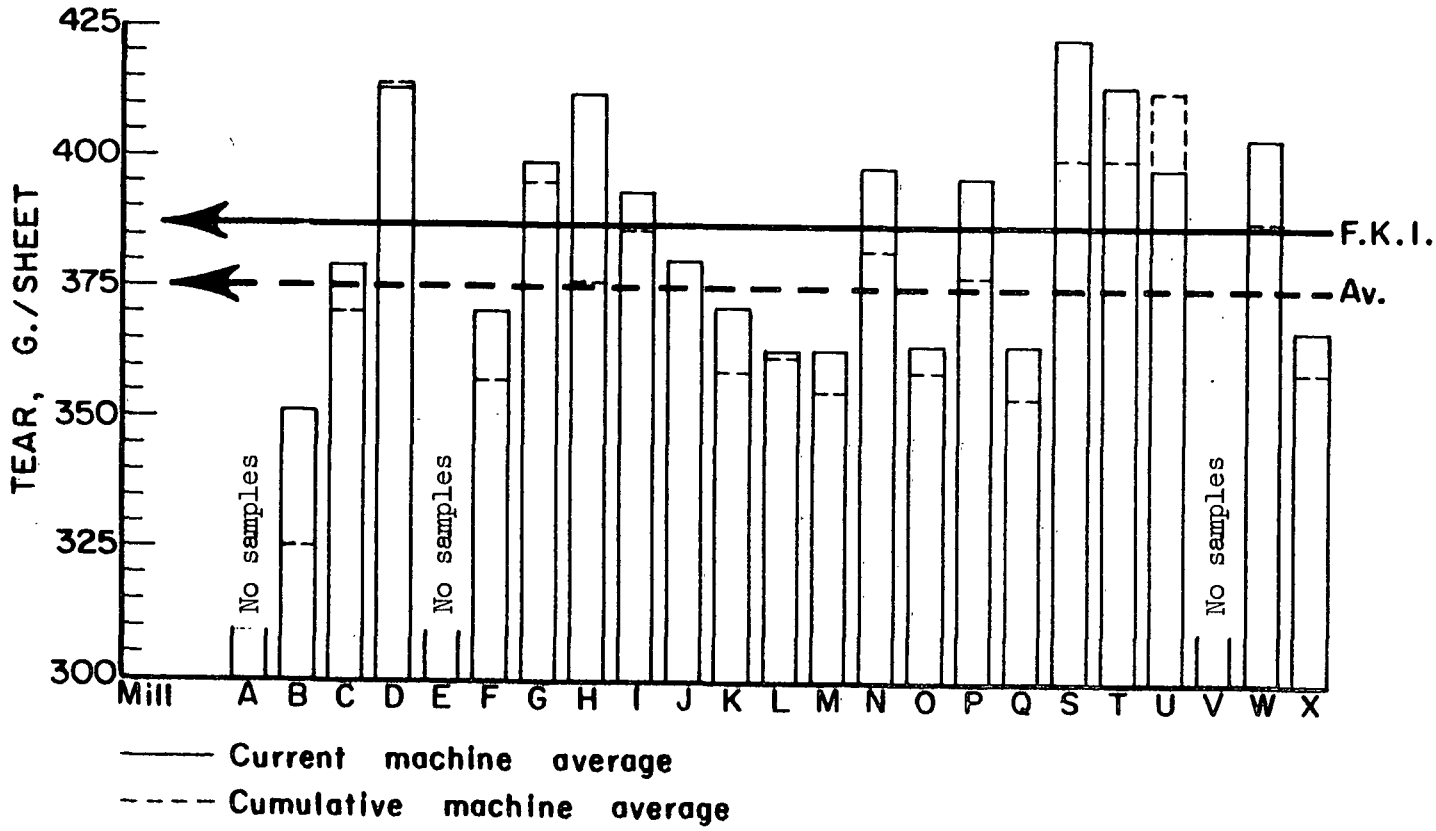

Figure 5. Comparison of Cross-Machine Direction Tear Results

Test	Current Mill Averages Max.	Min.	F.K.I. Averages Current	Cumulative
Basis weight, lb.	43.9	42.1	42.8	42.9
Caliper, points	13.7	11.7	12.9	12.7
Bursting strength, p.s.i. gage	117	101	110	109
Machine direction Elmendorf tear, g./sheet	387	291	340	330
Cross-machine direction Elmendorf tear, g./sheet	423	351	387	375

The test results obtained at the Institute and at the mill during June and July are given alphabetically in Tables IV to XXVI for each mill. Included in each of these tables are the maximum, minimum and average test data obtained at the Institute on each sample lot of linerboard. The data obtained at the Institute include also for each test the calculation of (1) a current mill average that represents the mean of the averages obtained on the individual sample lots of linerboard evaluated during the current period, (2) a cumulative mill average that represents the mean of the current mill averages for the previous twelve months excluding the current period, (3) a mill factor expressed in per cent that represents the ratio of the current mill average to the cumulative mill average, and (4) a mill index expressed in per cent that represents the ratio of the current mill average to the cumulative F.K.I. average. The term "mean" in the preceding discussion is synonymous with the simple arithmetic average. As mentioned above, the results presented in Tables IV to XXVI also include data obtained at the mills. The mill data include for each test (1) the average result obtained on each sample lot of linerboard and (2) a current mill average (calculated at the Institute) that represents the mean of the averages obtained on the individual sample lots of linerboard. In addition to the presentations of Institute and mill data described above, Tables IV through XXVI also include under each test heading a column labeled "Diff." This

TABLE IV

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL A

June and July, 1963

Date Made	Finish	Mch. No.	Basis Weight, lb. Institute Max.	Min.	Av.	Mill Av.	Diff.	Caliper, points Institute Max.	Min.	Av.	Mill Av.	Diff.	Bursting Strength, p.s.i. gage Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet In Machine Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet Cross Machine Institute Max.	Min.	Av.	Mill Av.	Diff.
No samples submitted.																											

TABLE V

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL B

5-16-63	WF1S	1	43.8	42.0	43.2	42.6	-0.6	13.0	11.2	12.4	12.2	-0.2	135	91	118	121	+3	336	232	280	262	-18	384	328	353[a]	344	- 9
5-20-63	WF1S	1	44.0	43.0	43.6	43.4	-0.2	14.0	12.7	13.3	13.0	-0.3	143	93	115	120	+5	312	216	281	283	+ 2	400	328	349[a]	365	+16
5-27-63	WF1S	1	43.6	42.2	43.0	43.1	+0.1	13.3	12.7	13.0	12.7	-0.3	139	104	119	122	+3	352	280	306	288	-18	392	328	361[a]	383	+22
5-28-63	WF1S	1	43.0	41.8	42.1	42.4	+0.3	13.4	12.3	13.0	12.9	-0.1	128	94	113	117	+4	336	256	295	281	-14	384	328	352[a]	377	+25
5-31-63	WF1S	1	43.4	42.0	42.6	43.3	+0.7	13.8	12.8	13.3	13.0	-0.3	141	108	122	122	0	352	240	284	287	+ 3	360	320	343[a]	387	+44
6-16-63	WF1S	1	42.4	41.6	42.1	42.2	+0.1	13.5	12.8	13.2	12.8	-0.4	127	95	112	119	+7	320	240	283	282	- 1	384	320	339[a]	377	+38
6-17-63	WF1S	1	43.8	42.4	43.5	43.1	-0.4	14.2	13.7	14.0	13.4	-0.6	140	90	115	119	+4	368	256	311[a]	293	-18	384	328	361[a]	390	+29
Current mill average:					42.9	42.9	0.0			13.2	12.9	-0.3			116	120	+4			291	282	- 9			351	375	+24
Cumulative mill average:					42.2					13.3					111					271					325		
Mill factor, %					101.7					99.2					104.5					107.4					108.0		
Mill index, %					100.0					103.9					106.4					88.2					93.6		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE VI

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL C

June and July, 1963

Date Made	Finish	Mch. No.	Basis Weight, lb. Institute Max.	Min.	Av.	Mill Av.	Diff.	Caliper, points Institute Max.	Min.	Av.	Mill Av.	Diff.	Bursting Strength, p.s.i. gage Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet In Machine Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet Cross Machine Institute Max.	Min.	Av.	Mill Av.	Diff.
6- 6-63	W.F.	-	44.0	41.6	42.6	43.1	+0.5	13.6	12.5	13.1	12.9	-0.2	128	89	109	112	+3	408	320	360[a]	335	-25	464	320	384[a]	372	-12
6-16-63	W.F.	-	43.8	42.0	42.6	43.3	+0.7	13.1	12.0	12.6	12.4	-0.2	134	93	112	112	0	416	328	365[a]	331	-34	408	320	374[a]	376	+ 2
Current mill average:					42.6	43.2	+0.6			12.8	12.6	-0.2			110	112	+2			362	333	-29			379	374	- 5
Cumulative mill average:					42.7					12.4					110					351					370		
Mill factor, %					99.8					103.2					100.0					103.1					102.4		
Mill index, %					99.3					100.8					100.9					109.7					101.1		

TABLE VII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL D

5-28-63	W.B.	-	43.6	42.2	42.8	42.7	-0.1	14.2	13.0	13.5	13.1	-0.4	130	84	105	105	0	400	320	365[a]	431	+66	464	360	403[a]	449	+46
6- 7-63	W.B.	-	43.4	42.0	42.5	42.6	+0.1	12.9	11.4	12.3	12.0	-0.3	136	104	116	110	-6	440	320	369	431	+62	472	384	418[a]	429	+11
6-21-63	W.B.	-	43.0	42.0	42.2	42.5	+0.3	13.7	12.6	13.1	12.6	-0.5	121	87	106	107	+1	464	352	403[a]	416	+13	448	384	411[a]	409	- 2
6-26-63	W.B.	-	44.2	41.6	43.2	43.2	0.0	14.4	13.2	13.9	13.3	-0.6	129	80	107	108	+1	416	344	382[a]	448	+66	464	328	418[a]	441	+23
Current mill average:					42.7	42.8	+0.1			13.2	12.8	-0.4			108	107	-1			380	431	+51			413	432	+19
Cumulative mill average:					43.2					12.6					106					370					414		
Mill factor, %					98.8					104.8					101.9					102.7					99.8		
Mill index, %					99.5					103.9					99.1					115.2					110.1		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE VIII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL E

June and July, 1963

Date Made	Finish	Mch. No.	Basis Weight, lb. Institute Max.	Min.	Av.	Mill Av.	Diff.	Caliper, points Institute Max.	Min.	Av.	Mill Av.	Diff.	Bursting Strength, p.s.i. gage Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet In Machine Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet Cross Machine Institute Max.	Min.	Av.	Mill Av.	Diff.
No samples submitted.																											

TABLE IX

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL F

6- 1-63	WF1S	2	44.2	43.0	43.5	44.3	+0.8	14.1	13.0	13.7	13.5	-0.2	143	83	114	110	- 4	360	240	312[a]	327	+15	408	344	371[a]	428	+57
6- 6-63	WF1S	2	44.4	42.4	43.4	44.2	+0.8	13.9	13.2	13.6	13.2	-0.4	136	91	115	110	- 5	352	280	309[a]	312	+ 3	392	312	357[a]	357	0
6-10-63	WF1S	2	44.2	43.4	43.8	44.2	+0.4	14.6	13.3	14.0	13.8	-0.2	138	85	113	104	- 9	440	272	325[a]	341	+16	392	336	365[a]	410	+45
6-16-63	WF1S	2	43.8	43.0	43.4	43.5	+0.1	13.6	12.5	13.0	12.8	-0.2	128	90	109	110	+ 1	368	280	321[a]	320	- 1	456	328	370[a]	428	+58
7- 3-63	WF1S	2	43.8	42.0	42.6	42.9	+0.3	13.6	12.7	13.1	12.5	-0.6	150	107	127	117	-10	392	256	326[a]	312	-14	432	352	375[a]	386	+11
7-12-63	WF1S	2	44.0	43.4	43.8	44.0	+0.2	13.8	12.8	13.4	12.9	-0.5	136	88	113	108	- 5	464	304	339[a]	320	-19	400	352	385[a]	430	+45
7-12-63	WF1S	2	43.0	42.0	42.4	42.7	+0.3	13.2	12.3	12.9	12.4	-0.5	144	102	124	114	-10	352	288	315	315	0	424	328	366[a]	354	-12
Current mill average:					43.2	43.7	+0.5			13.4	13.0	-0.4			116	110	- 6			321	321	0			370	399	+29
Cumulative mill average:					42.7					13.3					115					310					357		
Mill factor, %					101.2					100.8					100.9					103.5					103.6		
Mill index, %					100.7					105.5					106.4					97.3					98.7		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE X

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL G

June and July, 1963

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i. gage					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
4-16-63	W.F.	3	44.4	43.0	43.8	43.5	-0.3	13.3	12.5	12.9	12.4	-0.5	114	84	100	107	+7	360	256	309[a]	286	-23	432	336	384[a]	368	-16
4-21-63	W.F.	3	45.0	43.6	44.0	44.1	+0.1	13.2	12.4	12.7	12.3	-0.4	123	85	105	110	+5	384	304	339	308	-31	432	336	389[a]	397	+ 8
5-12-63	W.F.	3	45.0	44.0	44.4	44.6	+0.2	13.5	11.9	13.0	12.8	-0.2	130	89	111	116	+5	400	312	352[a]	345	- 7	440	352	395[a]	400	+ 5
5-12-63[b]	W.F.	3	45.0	44.0	44.4	44.4	0.0	13.3	12.3	13.0	12.8	-0.2	137	90	113	115	+2	392	304	350	319	-31	440	368	395[a]	425	+30
5-27-63	W.F.	3	45.8	43.8	44.4	44.4	0.0	14.0	12.8	13.3	12.5	-0.8	140	90	115	116	+1	432	336	386	360	-26	464	352	396[a]	424	+28
5-31-63	W.F.	3	44.8	43.0	43.9	44.5	+0.6	13.9	12.7	13.2	12.7	-0.5	130	90	116	117	+1	400	304	355	365	+10	472	360	409[a]	428	+19
6-21-63	W.F.	3	44.6	43.6	44.1	44.6	+0.5	13.7	12.9	13.2	12.8	-0.4	139	96	119	115	-4	440	320	365	379	+14	448	368	410[a]	418	+ 8
6-22-63	W.F.	3	44.6	43.6	44.1	44.6	+0.5	13.7	12.6	13.2	12.3	-0.9	135	100	117	115	-2	400	336	358[a]	347	-11	496	368	424[a]	405	-19
6-29-63	W.F.	3	44.2	43.6	43.9	44.3	+0.4	13.6	12.8	13.1	12.5	-0.6	142	90	116	115	-1	400	304	353	321	-32	456	352	399[a]	389	-10
6-30-63	W.F.	3	44.0	43.0	43.6	44.3	+0.7	13.8	12.7	13.2	12.6	-0.6	128	99	112	115	+3	432	288	357	367	+10	440	352	395[a]	416	+21
7- 1-63	W.F.	3	43.8	42.2	43.0	43.3	+0.3	13.9	12.5	13.2	12.4	-0.8	125	82	103	110	+7	440	312	370	329	-41	448	360	401[a]	393	- 8
7- 2-63	W.F.	3	44.0	43.0	43.6	43.5	-0.1	13.8	12.0	13.0	12.4	-0.6	138	67	105	109	+4	432	296	359	331	-28	448	352	395[a]	401	+ 6
Current mill average:					43.9	44.2	+0.3			13.1	12.5	-0.6			111	113	+2			354	338	-16			399	405	+ 6
Cumulative mill average:					43.4					12.6					112					346					395		
Mill factor, %					101.2					104.0					99.1					102.3					101.0		
Mill index, %					102.3					103.1					101.8					107.3					106.4		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

[b]This date appeared on the sample received by the Institute. The mill data sheet gives the date of manufacture as May 14, 1963.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XI

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL H

June and July, 1963

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i. gage					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
5-27-63	WFlS	1	43.4	40.6	42.0	42.2	+0.2	14.5	12.5	13.4	12.9	-0.5	128	89	111	106	-5	432	304	355	342	-13	456	368	407[a]	392	-15
5-29-63	WFlS	1	43.0	40.6	42.2	42.3	+0.1	14.3	12.3	13.3	13.0	-0.3	131	98	113	109	-4	392	288	333	329	- 4	472	368	412[a]	391	-21
6- 9-63	WFlS	1	43.6	41.0	41.9	42.2	+0.3	14.7	12.0	13.7	13.0	-0.7	130	87	115	107	-8	432	286	339	373	+34	448	368	400[a]	428	+28
6-20-63	WFlS	1	43.6	41.4	42.4	42.1	-0.3	14.4	12.8	13.5	12.9	-0.6	121	92	110	109	-1	400	320	367[a]	371	+ 4	488	360	428[a]	413	-15
Current mill average:					42.1	42.2	+0.1			13.5	13.0	-0.5			112	108	-4			348	354	+ 6			412	406	- 6
Cumulative mill average:					42.5					12.9					108					329					376		
Mill factor, %					99.1					104.7					103.7					105.8					109.6		
Mill index, %					96.1					106.3					102.8					105.5					109.9		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL I

June and July, 1963

Date Made	Finish	Mch. No.	Basis Weight, lb. Institute Max.	Institute Min.	Institute Av.	Mill Av.	Diff.	Caliper, points Institute Max.	Institute Min.	Institute Av.	Mill Av.	Diff.
6-12-63	W.F.	2	43.8	42.0	42.9	43.3	+0.4	13.8	12.3	13.2	13.0	-0.2
6-12-63	W.F.	2	43.6	42.0	42.7	43.4	+0.7	13.8	13.0	13.4	13.1	-0.3
[illegible]	[illegible]	[illegible]	43.6	[illegible]	43.1	43.0	[illegible]	13.1	[illegible]	[illegible]	[illegible]	-0.3
[illegible]	[illegible]	[illegible]	43.8	[illegible]	43.6	43.2	[illegible]	[illegible]	12.8	[illegible]	12.4	-0.3
[illegible]	W.F.	2	44.0	42.0	43.1	43.1	0.0	13.0	12.1	12.5	12.3	-0.2
[illegible]	[illegible]	[illegible]	[illegible]	43.8	[illegible]	44.4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-0.2
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-0.2
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Current mill average					43.3	43.5	[illegible]			12.8	[illegible]	-0.2
Cumulative mill average					43.1					12.8		
Mill factor, %					100.5					100.0		
Mill index, %					100.9					100.8		

Date Made	Bursting Strength, p.s.i. gage Institute Max.	Institute Min.	Institute Av.	Mill Av.	Diff.
6-12-63	133	96	113	110	-3
6-12-63	130	85	109	109	0
[illegible]	134	99	115	113	-2
[illegible]	128	91	[illegible]	[illegible]	[illegible]
[illegible]	138	90	114	115	-1
[illegible]	[illegible]	95	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Current mill average			113	111	-2
Cumulative mill average			112		
Mill factor, %			100.9		
Mill index, %			103.7		

Date Made	Elmendorf Tear, g./sheet In Machine Institute Max.	Institute Min.	Institute Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet Cross Machine Institute Max.	Institute Min.	Institute Av.	Mill Av.	Diff.
6-12-63	352	264	327[a]	349	+22	456	360	392[a]	414	+22
6-12-63	400	320	353	367	+14	432	352	392[a]	425	+33
[illegible]	352	304	332[a]	332	0	424	344	381[a]	400	+19
[illegible]	364	280	323	329	- 6	392	328	365[a]	[illegible]	[illegible]
[illegible]	416	272	336	324	-12	464	352	415[a]	391	-24
[illegible]	400	256	343	330	-13	432	368	399[a]	398	[illegible]
[illegible]	400	320	363[a]	335	-28	464	328	403[a]	389	-14
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	448	368	[illegible]	406	[illegible]
Current mill average			341	[illegible]	- 4			393	402	- 9
Cumulative mill average			330					386		
Mill factor, %			101.3					101.8		
Mill index, %			103.3					104.8		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XIII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL J

June and July, 1963

Date Made	Finish	Mch. No.	Basis Weight, lb. Institute Max.	Min.	Av.	Mill Av.	Diff.	Caliper, points Institute Max.	Min.	Av.	Mill Av.	Diff.	Bursting Strength, p.s.i. gage Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet In Machine Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet Cross Machine Institute Max.	Min.	Av.	Mill Av.	Diff.
6-26-63	----	-	43.6	41.4	42.2	42.2	0.0	14.3	12.8	13.6	13.0	-0.6	128	69	107	111	+4	384	304	345	---	---	456	336	379[a]	---	---
7-11-63	----	-	43.2	41.0	42.2	42.4	+0.2	14.5	12.5	13.6	12.9	-0.7	144	69	102	108	+6	408	272	346	---	---	400	320	369[a]	---	---
7-22-63	----	-	43.4	41.0	41.8	41.5	-0.3	14.8	13.3	14.0	13.9	-0.1	138	82	107	110	+3	472	264	378	---	---	432	344	394[a]	---	---
Current mill average:					42.1	42.0	-0.1			13.7	13.2	-0.5			105	110	+5			356					380		
Cumulative mill average:					----					----					---					---					---		
Mill factor, %					----					----					---					---					---		
Mill index, %					98.1					107.9					96.3					107.9					101.3		

TABLE XIV

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL K

5-22-63	W.F.	1	44.0	42.2	42.9	43.0	+0.1	12.4	11.6	11.9	11.8	-0.1	131	83	110	113	+3	376	288	332[a]	329	- 3	416	344	373[a]	380	+ 7
5-24-63	W.F.	1	45.6	43.6	44.5	44.0	-0.5	12.7	11.9	12.4	12.2	-0.2	132	95	113	117	+4	392	304	353[a]	352	- 1	432	328	398[a]	364	-34
6- 8-63	W.F.	2	43.6	40.0	42.8	43.0	+0.2	12.7	11.8	12.1	12.0	-0.1	139	99	116	118	+2	384	312	348[a]	337	-11	416	352	389[a]	375	-14
6-27-63	W.F.	1	43.8	42.2	43.0	43.8	+0.8	12.6	11.6	12.0	11.7	-0.3	127	82	106	114	+8	352	280	312[a]	353	+41	368	320	346[a]	382	+36
6-30-63	W.F.	1	43.6	41.8	42.6	43.5	+0.9	12.4	11.9	12.1	12.0	-0.1	128	94	111	116	+5	368	264	316[a]	326	+10	384	320	350[a]	362	+12
Current mill average:					43.2	43.5	+0.3			12.1	12.0	-0.1			111	115	+4			332	340	+ 8			371	373	+ 2
Cumulative mill average:					43.1					12.0					115					323					359		
Mill factor, %					100.2					100.8					96.5					102.8					103.3		
Mill index, %					100.7					95.3					101.8					100.6					98.9		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XV

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL L

June and July, 1963

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i. gage					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
5-30-63	W.F.	-	44.0	41.6	42.9	43.0	+0.1	13.4	12.6	13.0	12.8	-0.2	134	96	112	107	-5	400	280	343[a]	315	-28	520	336	383[a]	345	-38
5-31-63	W.F.	-	43.6	42.4	42.8	42.8	0.0	13.6	12.4	13.1	12.8	-0.3	129	85	110	106	-4	376	288	326[a]	295	-31	384	320	359[a]	329	-30
6- 7-63	W.F.	-	43.6	42.4	42.9	42.7	-0.2	12.1	11.5	11.8	11.8	0.0	142	102	121	117	-4	352	280	306[a]	291	-15	440	320	365[a]	345	-20
6-14-63	W.F.	-	44.2	42.2	42.9	42.8	-0.1	12.8	12.0	12.3	12.3	0.0	133	76	110	113	+3	440	280	334[a]	312	-22	392	304	359[a]	347	-12
6-27-63	W.F.	-	43.8	42.2	42.9	43.2	+0.3	13.0	12.2	12.8	12.1	-0.7	135	99	118	109	-9	384	248	325[a]	320	- 5	392	336	357[a]	341	-16
6-28-63	W.F.	-	43.8	42.4	43.2	43.2	0.0	12.5	11.9	12.1	11.8	-0.3	131	100	116	110	-6	368	280	334	340	+ 6	400	304	361[a]	353	- 8
7-12-63	W.F.	-	44.0	43.2	43.8	43.4	-0.4	12.2	11.8	12.0	11.9	-0.1	129	104	117	118	+1	368	256	309[a]	299	-10	400	320	358[a]	367	+ 9
7-19-63	W.F.	-	43.8	42.4	43.3	43.0	-0.3	13.8	12.8	13.2	12.8	-0.4	122	80	102	101	-1	384	272	332[a]	313	-19	392	328	359[a]	349	-10
Current mill average:					43.1	43.0	-0.1			12.5	12.3	-0.2			113	110	-3			326	311	-15			363	347	-16
Cumulative mill average:					43.2					12.5					114					318					362		
Mill factor, %					99.8					100.0					99.1					102.5					100.3		
Mill index, %					100.5					98.4					103.7					98.8					96.8		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XVI

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL M

June and July, 1963

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i. gage					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
5-20-63	W.F.	1	42.2	41.6	41.9	42.2	+0.3	12.8	12.1	12.5	13.2	+0.7	139	85	113	113	0	320	256	287[a]	261	-26	392	320	357[a]	351	- 6
5-28-63	W.F.	1	43.6	42.6	43.3	42.7	-0.6	13.3	12.5	13.1	13.3	+0.2	148	82	117	117	0	328	280	298	262	-36	400	328	362[a]	368	+ 6
7- 5-63	W.F.	1	43.8	42.8	43.5	42.7	-0.8	13.8	13.0	13.3	13.2	-0.1	148	80	118	120	+2	352	288	322	279	-43	408	336	369[a]	358	-11
7-13-63	W.F.	1	42.4	41.4	41.9	42.2	+0.3	13.9	13.0	13.3	13.2	-0.1	130	84	104	109	+5	336	248	311[a]	272	-39	392	336	365[a]	344	-21
Current mill average:					42.7	42.5	-0.2			13.1	13.2	+0.1			113	115	+2			304	269	-35			363	355	- 8
Cumulative mill average:					42.6					13.1					111					297					355		
Mill factor, %					100.2					100.0					101.8					102.4					102.3		
Mill index, %					99.5					103.1					103.7					92.1					96.8		

TABLE XVII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL N

5-28-63	S.F.	7	43.6	40.0	42.0	42.8	+0.8	12.9	12.0	12.4	12.6	+0.2	141	84	105	101	-4	456	304	371[a]	395	+24	472	344	387[a]	424	+37
6-20-63	S.F.	7	44.4	41.6	42.6	43.5	+0.9	13.6	12.0	12.8	12.8	0.0	124	79	101	98	-3	464	320	385[a]	418	+33	464	384	418[a]	439	+21
7-11-63	S.F.	7	43.6	41.6	42.4	42.5	+0.1	13.5	12.3	12.8	12.5	-0.3	110	80	97	99	+2	432	320	355[a]	361	+ 6	416	352	389[a]	390	+ 1
Current mill average:					42.4	42.9	+0.5			12.7	12.6	-0.1			101	99	-2			370	391	+21			398	416	+20
Cumulative mill average:					42.2					12.4					100					340					382		
Mill factor, %					100.5					102.4					101.0					108.8					104.2		
Mill index, %					98.8					100.0					92.7					112.1					106.1		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XVIII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL O

June and July, 1963

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i. gage					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
5-22-63	----	1	43.6	42.5	43.2	43.8	+0.6	13.4	12.1	12.8	12.4	-0.4	125	83	104	103	-1	392	280	332[a]	300	-32	400	304	367[a]	352	-15
6-12-63	----	1	42.8	40.8	42.0	45.4	+3.4	13.4	12.2	12.8	12.4	-0.4	134	100	114	111	-3	368	256	305[a]	292	-13	384	320	347[a]	347	0
6-17-63	----	1	44.0	42.0	42.5	42.8	+0.3	13.2	12.5	12.9	12.4	-0.5	121	72	97	100	+3	336	240	305	297	- 8	392	336	359[a]	360	+ 1
6-17-63	----	1	44.5	42.6	43.1	43.6	+0.5	13.2	12.3	12.9	12.5	-0.4	116	73	98	101	+3	360	272	311[a]	298	-13	384	336	364[a]	360	- 4
6-28-63	----	1	44.7	42.8	43.6	44.5	+0.9	14.3	12.2	13.2	12.7	-0.5	128	88	110	112	+2	368	296	336[a]	292	-44	400	336	361[a]	346	-15
7- 1-63	----	1	42.8	42.4	42.7	43.5	+0.8	13.9	12.6	13.2	12.7	-0.5	120	81	104	105	+1	352	272	305	282	-23	432	320	380[a]	348	-32
7- 8-63	----	1	42.6	40.2	41.6	42.4	+0.8	13.8	12.0	12.9	12.2	-0.7	126	85	103	104	+1	384	264	318	295	-23	416	328	366[a]	349	-17
Current mill average:					42.7	43.7	+1.0			12.9	12.5	-0.4			104	105	+1			316	294	-22			364	352	-12
Cumulative mill average:					43.2					13.2					106					324					359		
Mill factor, %					98.8					97.7					98.1					97.5					101.4		
Mill index, %					99.5					101.6					95.4					95.8					97.1		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XIX

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL P

June and July, 1963

Date Made	Finish	Mch. No.	Basis Weight, lb. Institute Max.	Min.	Av.	Mill Av.	Diff.	Caliper, points Institute Max.	Min.	Av.	Mill Av.	Diff.	Bursting Strength, p.s.i. gage Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet In Machine Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet Cross Machine Institute Max.	Min.	Av.	Mill Av.	Diff.
5-21-63	WF1S	1	44.0	42.4	43.3	42.9	-0.4	13.1	11.6	12.5	12.5	0.0	133	91	111	108	-3	384	304	328	341	+13	456	368	400[a]	423	+23
5-30-63	WF1S	1	43.8	42.0	42.8	42.8	0.0	12.9	12.0	12.4	12.2	-0.2	131	91	110	107	-3	384	304	344	336	- 8	432	344	387[a]	421	+34
6- 4-63	WF1S	1	45.0	43.0	43.7	43.4	-0.3	13.2	12.2	12.7	12.5	-0.2	132	94	111	108	-3	368	280	325	321	- 4	464	344	395[a]	400	+ 5
6-12-63	WF1S	1	44.4	42.4	43.3	42.6	-0.7	13.1	11.6	12.4	12.4	0.0	130	91	112	109	-3	376	256	325	333	+ 8	456	344	385[a]	418	+33
6-20-63	WF1S	1	43.2	41.8	42.3	42.6	+0.3	13.8	12.1	12.9	12.5	-0.4	130	85	106	106	0	336	288	311	335	+24	432	352	389[a]	411	+22
6-26-63	WF1S	1	43.8	42.0	43.0	43.5	+0.5	13.3	12.0	12.7	12.2	-0.5	136	94	112	109	-3	360	288	324[a]	343	+19	416	352	391[a]	422	+31
7- 9-63	WF1S	1	43.6	41.8	42.5	43.2	+0.7	14.0	12.9	13.2	12.7	-0.5	134	82	103	108	+5	368	280	322[a]	345	+23	432	360	393[a]	424	+31
7-17-63	WF1S	1	44.0	43.0	43.7	42.9	-0.8	13.6	12.0	12.9	12.4	-0.5	133	92	111	108	-3	424	320	361[a]	322	-39	480	384	427[a]	405	-22
Current mill average:					43.1	43.0	-0.1			12.7	12.4	-0.3			110	108	-2			330	334	+ 4			396	415	+19
Cumulative mill average:					42.9					12.7					105					313					377		
Mill factor, %					100.5					100.0					104.8					105.4					105.0		
Mill index, %					100.5					100.0					100.9					100.0					105.6		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XX

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL Q

June and July, 1963

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i. gage					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
5- 3-63	W.F.	1	44.0	41.2	42.6	42.6	0.0	12.3	11.3	11.9	11.7	-0.2	124	89	107	107	0	360	272	311	278	-33	384	320	361[a]	357	- 4
5-16-63	W.F.	1	44.4	42.0	43.0	42.0	-1.0	13.1	12.1	12.6	12.1	-0.5	131	83	107	108	+1	384	256	316	281	-35	432	344	384[a]	347	-37
5-29-63	--	1	45.0	41.6	43.3	42.6	-0.7	13.5	12.2	12.6	12.2	-0.4	138	90	109	111	+2	368	272	316	289	-27	408	328	361[a]	345	-16
6- 7-63	W.F.	1	43.6	41.6	42.4	42.8	+0.4	13.7	12.0	12.9	12.3	-0.6	130	88	110	112	+2	336	256	296	271	-25	392	320	351[a]	350	- 1
6-24-63	W.F.	1	44.0	41.8	42.8	42.6	-0.2	13.1	12.1	12.6	12.3	-0.3	132	87	109	111	+2	352	240	282	282	0	416	320	365[a]	363	- 2
Current mill average:					42.6	42.5	-0.3			12.5	12.1	-0.4			109	110	+1			304	280	-24			364	352	-12
Cumulative mill average:					43.2					12.3					109					301					354		
Mill factor, %					99.1					101.6					100.0					101.0					102.8		
Mill index, %					99.8					98.4					100.0					92.1					97.1		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XXI

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL S

June and July, 1963

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i. gage					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
6- 3-63	----	2	43.4	42.2	42.7	42.5	-0.2	12.3	11.4	11.9	11.3	-0.6	137	100	122	121	-1	432	352	382	---	---	496	384	437[a]	---	---
6- 4-63	----	2	42.6	42.0	42.2	42.0	-0.2	12.4	11.1	12.0	11.2	-0.8	129	86	108	106	-2	448	320	370[a]	---	---	456	376	419[a]	---	---
6- 8-63	----	1	42.2	40.6	41.4	41.7	+0.3	12.4	11.8	12.1	12.1	0.0	130	92	111	112	+1	424	320	373[a]	---	---	432	352	389[a]	---	---
6-11-63	----	1	42.2	41.0	41.9	41.7	-0.2	13.3	12.0	12.8	12.7	-0.1	126	80	111	113	+2	392	336	354[a]	---	---	440	368	408[a]	---	---
7-15-63	----	2	45.0	44.0	44.2	43.6	-0.6	13.6	12.4	13.0	12.8	-0.2	137	88	113	109	-4	480	376	414[a]	---	---	520	384	445[a]	---	---
7-15-63	----	1	44.4	42.8	43.8	43.0	-0.8	13.8	13.0	13.4	13.2	-0.2	142	77	109	116	+7	416	344	379	---	---	488	376	429[a]	---	---
7-16-63	----	2	44.0	42.0	43.1	41.7	-1.4	12.9	12.0	12.4	12.4	0.0	130	86	110	112	+2	464	400	436[a]	---	---	480	368	433[a]	---	---
Current mill average:					42.8	42.3	-0.5			12.5	12.2	-0.3			112	113	+1			387					423		
Cumulative mill average:					43.5					12.5					105					363					400		
Mill factor, %					98.4					100.0					106.7					106.6					105.8		
Mill index, %					99.8					98.4					102.8					117.3					112.8		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XXII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL T

June and July, 1963

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i. gage					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
5-22-63	W.B.	-	44.2	42.2	42.9	42.7	-0.2	12.2	10.8	11.7	11.4	-0.3	123	93	107	106	-1	424	328	375[a]	329	-46	440	360	414[a]	404	-10
5-23-63	W.B.	-	44.2	42.2	43.0	42.6	-0.4	12.2	11.0	11.6	11.5	-0.1	133	90	109	106	-3	440	328	378	351	-27	464	368	412[a]	395	-17
6- 7-63	W.B.	-	43.8	42.2	43.2	43.0	-0.2	12.5	11.2	11.8	11.4	-0.4	126	89	110	112	+2	432	336	394[a]	361	-33	464	368	404[a]	428	+24
6-19-63	W.B.	-	43.6	41.8	42.6	42.6	0.0	12.0	10.5	11.5	11.2	-0.3	128	86	108	110	+2	432	320	365[a]	352	-13	448	376	419[a]	409	-10
6-21-63	W.B.	-	43.2	42.2	42.6	42.8	+0.2	12.3	10.8	11.3	10.7	-0.6	138	97	118	114	-4	424	312	341	335	- 6	440	352	409[a]	413	+ 4
6-26-63	W.B.	-	44.0	42.2	43.3	43.4	+0.1	12.8	11.3	12.1	11.5	-0.6	128	87	109	107	-2	456	336	381[a]	344	-37	480	384	418[a]	404	-14
6-28-63	W.B.	-	44.2	43.6	43.8	43.6	-0.2	12.4	11.0	11.8	11.3	-0.5	131	86	104	107	+3	456	336	387[a]	348	-39	504	384	424[a]	421	- 3
Current mill average:					43.0	43.0	0.0			11.7	11.3	-0.4			109	109	0			374	346	-28			414	411	- 3
Cumulative mill average:					42.9					11.7					107					363					400		
Mill factor, %					100.2					100.0					101.9					103.0					103.5		
Mill index, %					100.2					92.1					100.0					113.3					110.4		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XXIII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL U

June and July, 1963

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i. gage					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
5-27-63	----	1	42.8	41.0	42.0	42.2	+0.2	13.6	11.5	12.5	12.3	-0.2	131	76	102	114	+12	432	312	365	303	-62	456	360	397[a]	357	-40
6- 5-63	----	1	42.2	41.2	41.8	41.8	0.0	13.7	12.0	12.8	12.6	-0.2	137	76	105	116	+11	416	280	335[a]	296	-39	424	352	397[a]	344	-53
6-12-63	----	1	43.6	42.2	42.7	43.3	+0.6	13.7	12.3	12.9	12.4	-0.5	140	87	109	121	+12	464	320	373[a]	341	-32	472	344	401[a]	388	-13
Current mill average:					42.2	42.4	+0.2			12.7	12.4	-0.3			106	117	+11			358	313	-45			398	363	-35
Cumulative mill average:					42.1					12.6					111					372					413		
Mill factor, %					100.2					100.8					95.5					96.2					96.4		
Mill index, %					98.4					100.0					97.2					108.5					106.1		

TABLE XXIV

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL V

No samples submitted.

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XXV

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL W

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i. gage					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
5-21-63	WF1S	2	44.4	42.0	43.4	43.1	-0.3	13.6	12.7	13.1	13.0	-0.1	126	81	109	106	-3	384	296	356	351	- 5	432	344	404[a]	470	+66
6- 9-63	WF1S	2	43.8	42.6	43.1	43.0	-0.1	14.0	13.0	13.5	12.9	-0.6	144	89	113	114	+1	376	272	335	351	+16	440	376	404[a]	446	+42
6-12-63	WF1S	2	43.6	41.6	42.6	42.6	0.0	14.2	13.0	13.5	13.0	-0.5	139	89	108	108	0	384	272	335[a]	342	+ 7	472	360	402[a]	415	+13
6- 3-63	WF1S	2	44.0	42.4	43.5	43.0	-0.5	14.7	13.0	13.5	12.7	-0.8	139	99	117	111	-6	456	312	364	338	-26	448	352	406[a]	441	+35
Current mill average:					43.2	42.9	-0.3			13.4	12.9	-0.5			112	110	-2			347	346	- 1			404	443	+39
Cumulative mill average:					42.7					13.4					106					333					388		
Mill factor, %					101.2					100.0					105.7					104.2					104.1		
Mill index, %					100.7					105.5					102.8					105.2					107.7		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XXVI

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL X

June and July, 1963

Date Made	Finish	Mch. No.	Basis Weight, lb. Institute Max.	Institute Min.	Institute Av.	Mill Av.	Diff.	Caliper, points Institute Max.	Institute Min.	Institute Av.	Mill Av.	Diff.	Bursting Strength, p.s.i. gage Institute Max.	Institute Min.	Institute Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet In Machine Institute Max.	Institute Min.	Institute Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet Cross Machine Institute Max.	Institute Min.	Institute Av.	Mill Av.	Diff.
5-18-63	W.F.	1	43.2	40.4	41.7	42.0	+0.3	12.6	11.3	11.9	11.7	-0.2	122	80	109	110	+1	328	256	289[a]	262	-27	368	312	347[a]	328	-19
5-20-63	W.F.	1	44.4	43.4	43.8	44.0	+0.2	13.3	12.0	12.5	12.4	-0.1	122	94	108	110	+2	368	264	311[a]	282	-29	416	328	363[a]	343	-20
5-22-63	W.F.	1	42.4	41.0	41.8	42.3	+0.5	12.9	12.2	12.5	12.5	0.0	120	85	101	107	+6	400	280	323[a]	280	-43	440	344	381[a]	359	-22
5-26-63	W.F.	1	42.6	41.4	42.0	42.2	+0.2	12.8	11.8	12.3	12.0	+0.3	121	93	108	107	-1	408	280	335[a]	283	-52	408	312	371[a]	356	-15
6- 2-63	W.F.	1	43.2	41.6	42.2	42.8	+0.6	14.1	11.0	12.6	12.4	-0.2	129	87	108	110	+2	336	248	303	275	-28	368	320	346[a]	364	+18
6- 4-63	W.F.	1	43.2	41.8	42.4	43.2	+0.8	13.0	12.0	12.5	12.0	-0.5	129	90	110	111	+1	376	280	333	305	-28	416	336	363[a]	376	+13
6- 6-63	W.F.	1	42.4	40.6	41.9	42.2	+0.3	12.9	11.9	12.3	11.9	-0.4	124	86	107	109	+2	416	280	325	299	-26	400	336	363[a]	370	+ 7
6-10-63	W.F.	1	43.4	41.8	42.6	43.0	+0.4	13.0	12.2	12.6	12.1	-0.5	125	99	111	112	+1	368	296	337[a]	309	-28	448	344	405[a]	392	-13
6-19-63	W.F.	1	43.6	41.2	42.5	42.7	+0.2	13.0	12.2	12.6	12.3	-0.3	130	91	110	110	0	432	288	344[a]	297	-47	432	328	377[a]	389	+12
6-21-63	W.F.	1	43.8	42.0	42.8	43.1	+0.3	13.2	12.5	12.9	12.6	-0.3	120	90	106	107	+1	392	272	333[a]	292	-41	392	336	364[a]	384	+20
6-24-63	W.F.	1	43.6	41.6	42.3	42.5	+0.2	12.8	11.8	12.3	12.0	-0.3	125	85	108	109	+1	400	288	339[a]	289	-50	416	344	380[a]	388	+ 8
6-29-63	W.F.	1	42.0	41.8	41.9	41.9	0.0	12.7	12.0	12.3	12.0	-0.3	124	87	106	107	+1	360	248	303[a]	271	-32	384	320	358[a]	354	- 4
7- 8-63	W.F.	1	42.2	42.0	42.1	42.6	+0.5	13.0	12.4	12.8	12.5	-0.3	120	83	103	106	+3	352	240	305[a]	263	-42	400	304	361[a]	330	-31
7- 9-63	W.F.	1	42.2	41.4	41.8	42.0	+0.2	13.0	12.0	12.5	12.1	-0.4	127	97	114	115	+1	392	288	319[a]	281	-38	432	360	383[a]	362	-21
7-10-63	W.F.	1	42.0	41.6	41.9	41.9	0.0	13.0	12.0	12.5	12.1	-0.4	125	100	112	110	-2	376	256	323[a]	270	-53	400	312	360[a]	342	-18
7-11-63	W.F.	1	42.0	41.2	41.8	42.2	+0.4	13.1	12.0	12.7	12.4	-0.3	121	93	108	108	0	352	264	303[a]	270	-33	368	296	351[a]	340	-11
Current mill average:					42.2	42.5	+0.3			12.5	12.2	-0.3			108	109	+1			320	283	-37			367	361	- 6
Cumulative mill average:					42.5					12.3					107					303					359		
Mill factor, %					99.3					101.6					100.9					105.6					102.2		
Mill index, %					98.4					98.4					99.1					97.0					97.9		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

column shows the differences between averages obtained at the Institute and those obtained at the mills. The data obtained at the Institute are used as the reference in calculating these differences.

The average test results obtained at the Institute and at the mills are summarized in Table XXVII for the current period. Shown in this table for each mill is the difference for each test between the current mill average based on Institute data and the current mill average based on mill data. In addition, for each test the maximum difference encountered in comparing Institute and mill averages for individual sample lots is shown. In Table XXVIII, the differences for each test between the current mill averages based on Institute data and those based on mill data shown in Table XXVII have been converted to per cent (based on Institute data as a reference). In addition, for purposes of comparison, the percentage differences from the previous bimonthly report are shown in Table XXVIII.

A summary of the agreement obtained in the comparisons of Institute and mill test data for the current period is shown in Table XXIX. This summary is based on the results given in Table XXVIII. The tabulated data show the number of mills, and the percentage of all mills which this number represents, whose average test results for the current period fall within designated percentages from the average test results obtained at the Institute. It may be noted from this summary that agreement between the results obtained at the Institute and those obtained at the mills was generally very good.

Preconditioning and conditioning data pertinent to the test results obtained at the mills during the current period are given in Table XXX.

TABLE XXVII

SUMMARY OF TEST RESULT COMPARISONS (AVERAGE MILL AND INSTITUTE RESULTS) FOR JUNE AND JULY, 1963

Mills[a]	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	S	T	U	V	W	X
No. of samples compared	0	7	2	4	0	7	12	4	8	3	5	8	4	3	7	8	5	7	7	3	0	4	16
Basis Weight																							
Institute		42.9	42.6	42.7		43.2	43.9	42.1	43.3	42.1	43.2	43.1	42.7	42.4	42.7	43.1	42.8	42.8	43.0	42.2		43.2	42.2
Mill		42.9	43.2	42.8		43.7	44.2	42.2	43.5	42.0	43.5	43.0	42.5	42.9	43.7	43.0	42.5	42.3	43.0	42.4		42.9	42.5
Av. diff.[b]		0.0	+0.6	+0.1		+0.5	+0.3	+0.1	+0.2	-0.1	+0.3	-0.1	-0.2	+0.5	+1.0	-0.1	-0.3	-0.5	0.0	+0.2		-0.3	+0.3
Max. diff.[c]		+0.7	+0.7	+0.3		+0.8	+0.7	±0.3	+0.7	-0.3	+0.9	-0.4	-0.8	+0.9	+3.4	-0.8	-1.0	-1.4	-0.4	+0.6		-0.5	+0.8
Caliper																							
Institute		13.2	12.8	13.2		13.4	13.1	13.5	12.8	13.7	12.1	12.5	13.1	12.7	12.9	12.7	12.5	12.5	11.7	12.7		13.4	12.5
Mill		12.9	12.6	12.8		13.0	12.5	13.0	12.6	13.2	12.0	12.3	13.2	12.6	12.5	12.4	12.1	12.2	11.3	12.4		12.9	12.2
Av. diff.[b]		-0.3	-0.2	-0.4		-0.4	-0.6	-0.5	-0.2	-0.5	-0.1	-0.2	+0.1	-0.1	-0.4	-0.3	-0.4	-0.3	-0.4	-0.3		-0.5	-0.3
Max. diff.[c]		-0.6	-0.2	-0.6		-0.6	-0.9	-0.7	-0.3	-0.7	-0.3	-0.7	+0.7	-0.3	-0.7	-0.5	-0.6	-0.8	-0.6	-0.5		-0.8	-0.5
Bursting Strength																							
Institute		116	110	108		116	111	112	113	105	111	113	113	101	104	110	109	112	109	106		112	108
Mill		120	112	107		110	113	108	111	110	115	110	115	99	105	108	110	113	109	117		110	109
Av. diff.[b]		+4	+2	-1		-6	+2	-4	-2	+5	+4	-3	+2	-2	+1	-2	+1	+1	0	+11		-2	+1
Max. diff.[c]		+7	+3	-6		-10	+7	-8	-6	+6	+8	-9	+5	-4	±3	+5	+2	+7	-4	+12		-6	+6
Tearing Strength, in																							
Institute		291	362	380		321	354	348	341	356	332	326	304	370	316	330	304	387	374	358		347	320
Mill		282	333	431		321	338	354	337	-	340	311	269	391	294	334	280	-	346	313		346	283
Av. diff.[b]		-9	-29	+51		0	-16	+6	-4	-	+8	-15	-35	+21	-22	+4	-24	-	-28	-45		-1	-37
Max. diff.[c]		-18	-34	+66		-19	-41	+34	-28	-	+41	-31	-43	+33	-44	-39	-35	-	-46	-62		-26	-53
Tearing Strength, cross																							
Institute		351	379	413		370	399	412	393	380	371	363	363	398	364	396	364	423	414	398		404	367
Mill		375	374	432		399	405	406	402	-	373	347	355	418	352	415	352	-	411	363		443	361
Av. diff.[b]		+24	-5	+19		+29	+6	-6	+9	-	+2	-16	-8	+20	-12	+19	-12	-	-3	-35		+39	-6
Max. diff.[c]		+44	-12	+46		+58	+30	+28	+33	-	+36	-38	-21	+37	-32	+34	-37	-	+24	-53		+66	-31

[a] Comparison based on averages involved only those samples on which mill test data were submitted.

[b] Average difference is the difference between the Institute mill average and the mill average based on mill test data.

[c] Maximum difference encountered in comparing the Institute average and the mill averages for any sample submitted by that particular mill.

TABLE XXVIII

COMPARISON OF INSTITUTE-MILL DIFFERENCES FOR JUNE AND JULY, 1963[a]
(Average difference, per cent)

Mill	Period	Basis Weight	Caliper	Bursting Strength	Tear, in	Tear, cross	Mill	Period	Basis Weight	Caliper	Bursting Strength	Tear, in	Tear, cross
A	Feb.-March	--	--	--	--	--	M	Feb.-March	-0.5	+0.8	+0.9	-12	-3
	April-May	--	--	--	--	--		April-May	+0.5	+2	+2	-13	-2
	Current	--	--	--	--	--		Current	-0.5	+0.8	+2	-12	-2
B	Feb.-March	-0.7	-5	+2	0	+5	N	Feb.-March	+2	+0.8	+3	+3	+1
	April-May	+0.5	-2	+4	+0.7	+8		April-May	+1	0	+1	+9	+7
	Current	0	-2	+3	-3	+7		Current	+1	-0.8	-2	+6	+5
C	Feb.-March	0	+0.8	-3	-8	+1	O	Feb.-March	+0.7	-2	-2	-8	-3
	April-May	+0.9	-0.8	-2	-7	+2		April-May	+2	-3	0	-6	-2
	Current	+1	-2	+2	-8	-1		Current	+2	-3	+1	-7	-3
D	Feb.-March	-0.5	0	+0.9	+16	+9	P	Feb.-March	-0.7	-2	+4	+12	+4
	April-May	-0.5	-2	+0.9	+6	+5		April-May	+0.2	-2	-0.9	-2	+4
	Current	+0.2	-3	-0.9	+13	+5		Current	-0.2	-2	-2	+1	+5
E	Feb.-March	-0.5	-4	-1	-12	-4	Q	Feb.-March	-2	-2	+3	-4	+3
	April-May	--	--	--	--	--		April-May	-0.7	-2	+3	-7	-2
	Current	--	--	--	--	--		Current	-0.7	-3	+0.9	-8	-3
F	Feb.-March	+0.5	-4	-2	-2	+4	S	Feb.-March	+0.7	0	+2	--	--
	April-May	+2	-2	-3	-0.3	+8		April-May	-0.5	-0.8	-2	--	--
	Current	+1	-3	-5	0	+8		Current	-1	-2	+0.9	--	--
G	Feb.-March	+1	-2	+0.9	+0.9	+5	T	Feb.-March	-0.2	-3	+0.9	-4	+5
	April-May	+0.9	-3	+3	-3	+3		April-May	-0.5	-3	+5	-10	-1
	Current	+0.7	-5	+2	-5	+2		Current	0	-3	0	-7	-0.7
H	Feb.-March	-0.2	-5	0	-6	-2	U	Feb.-March	+0.5	-2	+7	-14	-11
	April-May	-0.5	-4	-2	-8	-4		April-May	-0.2	-3	+14	-18	-12
	Current	+0.2	-4	-4	+2	-1		Current	+0.5	-2	+10	-13	-9
I	Feb.-March	-0.7	-0.8	-0.9	-2	+0.3	V	Feb.-March	--	--	--	--	--
	April-May	0	0	+3	-4	+0.8		April-May	--	--	--	--	--
	Current	+0.5	-2	-2	-1	+2		Current	--	--	--	--	--
J	Feb.-March	--	--	--	--	--	W	Feb.-March	-0.7	-0.7	+5	+0.8	+10
	April-May	--	--	--	--	--		April-May	0	-3	+4	+4	+10
	Current	-0.2	-4	+5	--	--		Current	-0.7	-4	-2	-0.3	+10
K	Feb.-March	-0.9	-3	+3	-6	-6	X	Feb.-March	+0.7	-2	+3	-12	-0.6
	April-May	+0.2	-2	+2	-4	0		April-May	+0.5	-2	+3	-8	+2
	Current	+0.7	-0.8	+4	+2	+0.5		Current	+0.7	-2	+0.9	-12	-2
L	Feb.-March	0	-2	-2	-5	-7							
	April-May	-0.0	-3	0	-7	-7							
	Current	-0.2	-2	-3	-5	-4							

[a] Differences for two previous periods are also shown in this table for reference purposes.

TABLE XXIX

SUMMARY OF AGREEMENT BETWEEN INSTITUTE AND MILL RESULTS

For June and July, 1963

	Average Percentage Difference Between Institute and Mill Test Results								
	±0.5	±1	±2	±3	±4	±5	±7.5	±10	±13
Basis weight									
Number of mills	10	19	20						
Percentage of all mills	50.0	95.0	100.0						
Caliper									
Number of mills	0	3	11	16	19	20			
Percentage of all mills	0.0	15.0	55.0	80.0	95.0	100.0			
Bursting strength									
Number of mills	1	6	13	15	17	19	19	20	
Percentage of all mills	5.0	30.0	65.0	75.0	85.0	95.0	95.0	100.0	
Tearing strength, in									
Number of mills	2	4	6	7	7	9	12	14	18
Percentage of all mills	11.1	22.2	33.3	38.9	38.9	50.0	66.7	77.8	100.0
Tearing strength, cross									
Number of mills	1	4	8	10	11	14	15	18	
Percentage of all mills	5.6	22.2	44.4	55.6	61.1	77.8	83.3	100.0	

TABLE XXX

PRECONDITIONING AND CONDITIONING DATA FOR MILL TESTS

June and July, 1963

Mill Code	Preconditioning			Preconditioning		
	R.H., %	Temp., °F.	Time, hr.	R.H., %	Temp., °F.	Time, hr.
A	No samples submitted					
B	50	73	96	50	73	96
C		None		50	73	24
D	59	72	48+	50	73	48+
E	No samples submitted					
F	50	72	24		None	
G		None		50	73	24
H	50	70-73	24	50	72-73	24
I	50	73	24	50	73	24
J		None		52-54	70	2-20
K		None		50	73	24
L	35-36	76-78	8	48-52	71-73	16
M		None		65-80	74-90	--
N	50	73	24		None	
O	50	72-78	3-384	50	72-78	3-60
P		None		55-56	71-72	--
Q	36-70	49-88	0.5	50-72	49-73	24-48
S		None		50	73	24
T		None		48-54	74	48
U	50	72-73	24-36		None	
V	No samples submitted					
W	50	72	120	50	72	120-192
X	35	73	24-48	50	73	48

THE INSTITUTE OF PAPER CHEMISTRY

W. N. Hubert, Research Aide
Container Section

R. C. McKee, Chief, Container Section